ESTILO” REFRIGERATORS FROM MABE

mabe

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IMPORTANT SAFETY NOTICE

Warning: This information is intended for use by individuals possessing adequate backgrounds of electrical, electronic and mechanical experience.

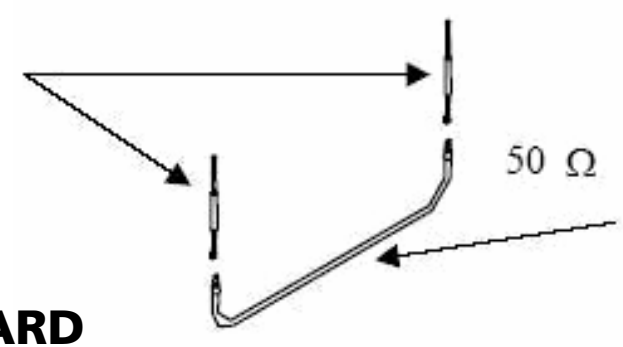
Any attempt to repair a major appliance may result in personal injury and property damage. The manufacturer or seller cannot be responsible for the interpretation of this information, nor can it assume any liability in connection with its use.

CAUTION

To avoid personal injury while servicing this unit, disconnect power before servicing. If grounding wires, screws, straps, clips, nuts, or washers used to complete a path to ground are removed for service, they must be returned to their original position and properly fastened.

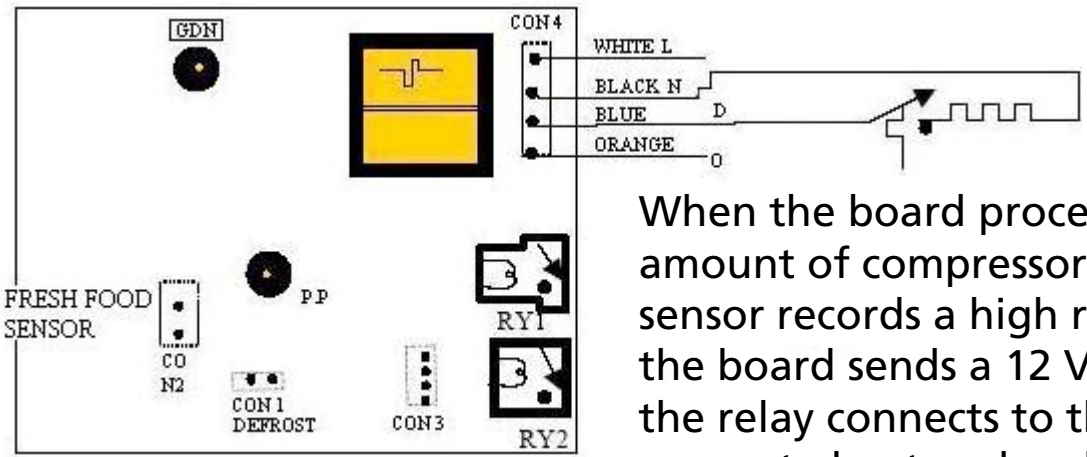
DEFROST CIRCUIT

The defrost circuit has a series of components that allows the frost formed during the cooling cycle: control board, defrost sensor, relay number 2 in the board, output port in the board, defrost thermostat, fuses and resistance (heater).



DEFROST RESISTANCE WITH METALLIC SHIELD

CONTROL BOARD



When the board processor has accumulated an amount of compressor operating time and the sensor records a high resistance value above 8.5 k., the board sends a 12 V. DC signal to the relay and the relay connects to the element in order to generate heat and melt all the accumulated frost.

DEFROST CIRCUIT (cont.)

If the heater is in circuit (on) for 20 minutes in the defrost cycle, the following cycle is increased by 2 hours; if it is connected for 30 minutes, it is maintained as is; if it is connected for 40 minutes, it is decreased by 2 hours. Thus, the defrost cycles are set within the minimum range of 8 hours, maximum range of 12 hours, increasing or decreasing by 2 hours, and no changes are made from 8 to 12 hours or 12 to 8 hours.

If the refrigerator is operating and is disconnected for a short time or if there is an electrical power failure, the board's stored memory relating to the time that the resistance was connected during the last defrost cycle is lost. Thus, when the shut-off temperature indicated by the potentiometer and the refrigerator's sensor is reached, the compressor is turned off and a defrost cycle is carried out, in order to record the time that the resistance is connected and to program the next defrost cycle.

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DEFROST CIRCUIT (cont.)

DEFROST SENSOR
The sensor's function is to detect the amount of ice and time that the element is enabled; in order to vary the time when the next defrost cycle should be enabled.

DEFROST THERMOSTAT The defrost thermostat consists of a one-pole switch, a bimetallic disc and a pressure bolt. These items are installed inside a metallic cylinder filled with epoxy putty. The cylinder has two connection cables, which are welded to the internal terminals of the cylinder.

If the defrost sensor does not disable the element operation after 35 minutes maximum and the thermostat's disconnection temperature is reached, the bimetallic disc is bent, disconnecting all terminals with the pressure bolt. When the evaporator's temperature drops enough (depending on the thermostat's specifications), the bimetallic disc recovers its shape and connects the terminals again. Thus, the bimetallic disc acts as a safety device to avoid the temperature reaching more than 22 °C (71.6 °F).

BIMETALLIC SAFETY THERMOSTAT

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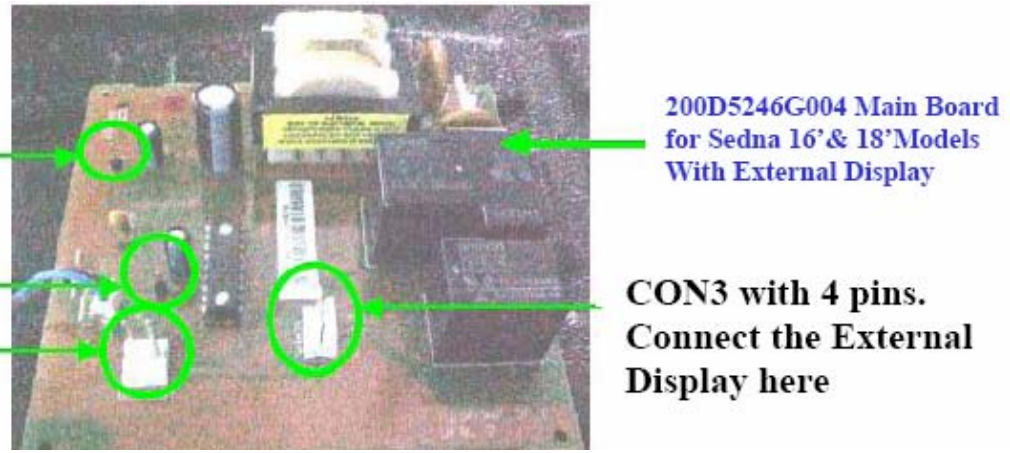
ELECTRONIC BOARD

For these models THERE ARE 2 DIFFERENT TYPES OF ELECTRONIC BOARD: ONE FOR THE **STANDARD AND DELUXE** (“X”, “Y”) MODELS, which are models with **BASIC ELECTRONICS** (see fact sheet PTR05014), and ANOTHER ONE FOR **SUPERDELUXE** (Z) MODELS, which have an **EXTERNAL DISPLAY** (see the following photos).

The different boards that have been used for the Polar, Polar Display and now Sedna models have a different adjustment and/or setting. Thus, if you need to change any of them, you must request the corresponding board for each model. The boards can be supplied as replacement parts, whose part number is shown in the following table.

SUPERDELUXE BOARD VERSION (Z MODELS, WITH EXTERNAL DISPLAY)
(The **Display Board** (Door) is the same one used in POLAR WITH EXTERNAL DISPLAY models.)

ELECTRONIC BOARD (cont.)



3.- OPERATION CHECK. NORMAL CYCLE AND DEFROST CYCLE OPERATION.

A) DISASSEMBLE THE CONTROL BOARD AND REMOVE THE EVAPORATOR COVER.

B) DE-ENERGIZE THE APPLIANCE (UNPLUG IT FROM THE ELECTRICAL OUTLET).

C) DISCONNECT THE WIRING HARNESS FROM THE FREEZER SENSOR CON1.

D) ENERGIZE THE APPLIANCE (PLUG IT INTO THE ELECTRICAL OUTLET).

E) AFTER APROX. 4 SECONDS, THE COMPRESSOR WILL TURN ON.

F) BRIDGE GND AND P_P (Test Point). THIS BRIDGE MUST REMAIN CONNECTED UNTIL STEP (G) HAS BEEN COMPLETED.

G) THE COMPRESSOR WILL TURN OFF AFTER A MAXIMUM TIME OF 5 SECONDS AND 5 SECONDS LATER THE DEFROST ELEMENT WILL START FUNCTIONING (As long as the temperature in the evaporator is low enough to have the Defrost Thermostat closed and allow current flow towards the element).

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ELECTRONIC BOARD (cont.)

H) BRIDGE THE CON1 PINS. THIS BRIDGE MUST REMAIN CONNECTED UNTIL STEP (I) HAS BEEN COMPLETED.

I) THE DEFROST ELEMENT MUST TURN OFF AFTER A MAXIMUM TIME OF 10 SECONDS.

J) DE-ENERGIZE THE APPLIANCE (UNPLUG IT FROM THE ELECTRICAL OUTLET).

K) CONNECT THE FREEZER SENSOR CON1.

L) ASSEMBLE THE CONTROL BOARD AND RE-PLACE THE EVAPORATOR COVER.

M) ENERGIZE THE APPLIANCE (PLUG IT INTO THE ELECTRICAL OUTLET).

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ELECTRONIC BOARD (cont.)

BASIC ELECTRONIC BOARD VERSION (“X”& “Y” Models, with Knob)

200D5940G003 Basic Electronic Main Board for Sedna 13’& 15’ Models

200D5940G004 Basic Electronic Main Board for Sedna 17’& 19’ Models These boards have a different adjustment and cannot be exchanged.

3.- OPERATION CHECK. DEFROST CYCLE OPERATION.

ELECTRONIC BOARD (cont.)

A) DISASSEMBLE THE CONTROL BOARD AND REMOVE THE EVAPORATOR COVER.
B) DE-ENERGIZE THE BOARD (UNPLUG THE BOARD-APPLIANCE WIRING HARNESS).
C) BRIDGE J2 AND J5. THIS BRIDGE MUST REMAIN CONNECTED UNTIL STEP (D) HAS BEEN COMPLETED.
D) ENERGIZE THE BOARD (PLUG THE BOARD-APPLIANCE WIRING HARNESS).
E) THE DEFROST ELEMENT SHOULD ACTIVATE (as long as the temperature in the evaporator is low enough to have the Defrost Thermostat closed and allow current flow towards the Resistance).
F) TO RE-ENABLE THE COMPRESSOR OPERATION, FOLLOW THE INSTRUCTIONS FROM STEP (G).
G) DE-ENERGIZE THE BOARD (UNPLUG THE BOARD-APPLIANCE WIRING HARNESS).
H) ENERGIZE THE BOARD (PLUG THE BOARD-APPLIANCE WIRING HARNESS). THIS PROCEDURE MUST BE FOLLOWED WITHOUT HAVING THE J2 AND J5 BRIDGE CONNECTED. I) ASSEMBLE THE CONTROL BOARD AND RE-PLACE THE EVAPORATOR COVER.

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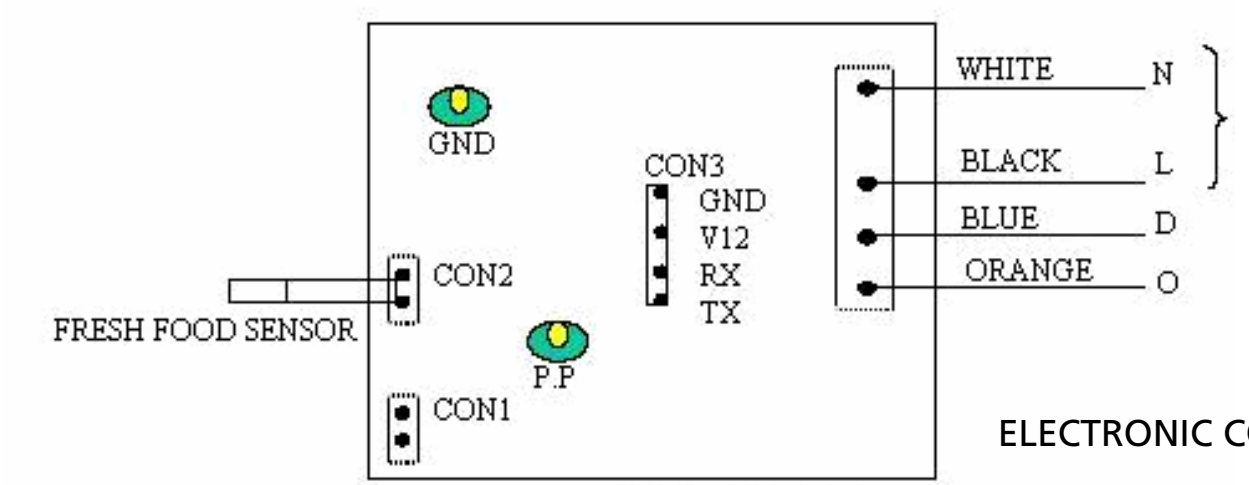
COMPRESSOR OPERATION

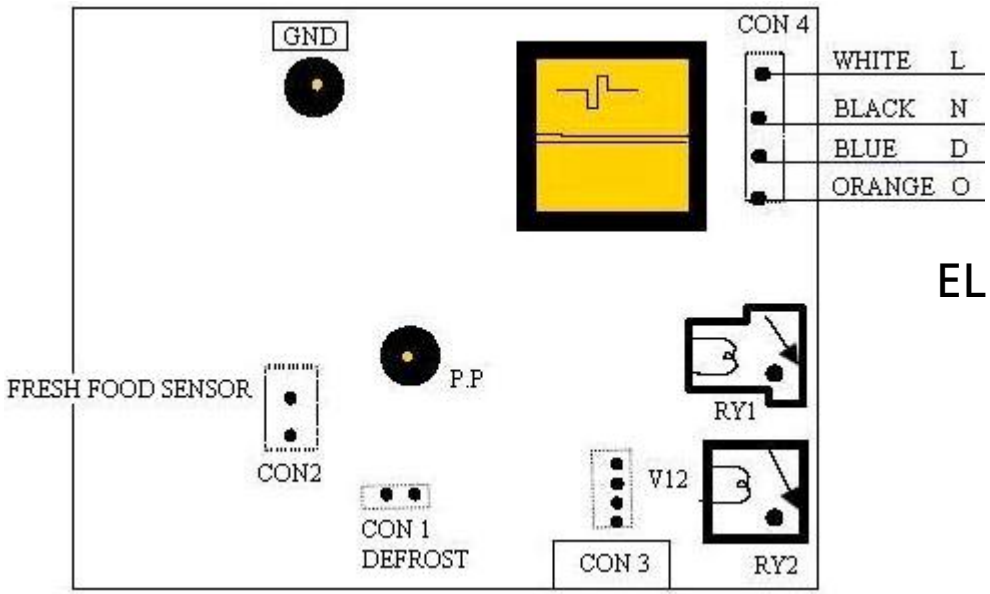
When applying a 127 A.C.V. to the white and black cables, the board is energized. If these internal elements are functioning properly, there will be a reading of 12 V.D.C. between test points GND and V12.



DIRECT TEST FOR THE ELECTRONIC BOARD

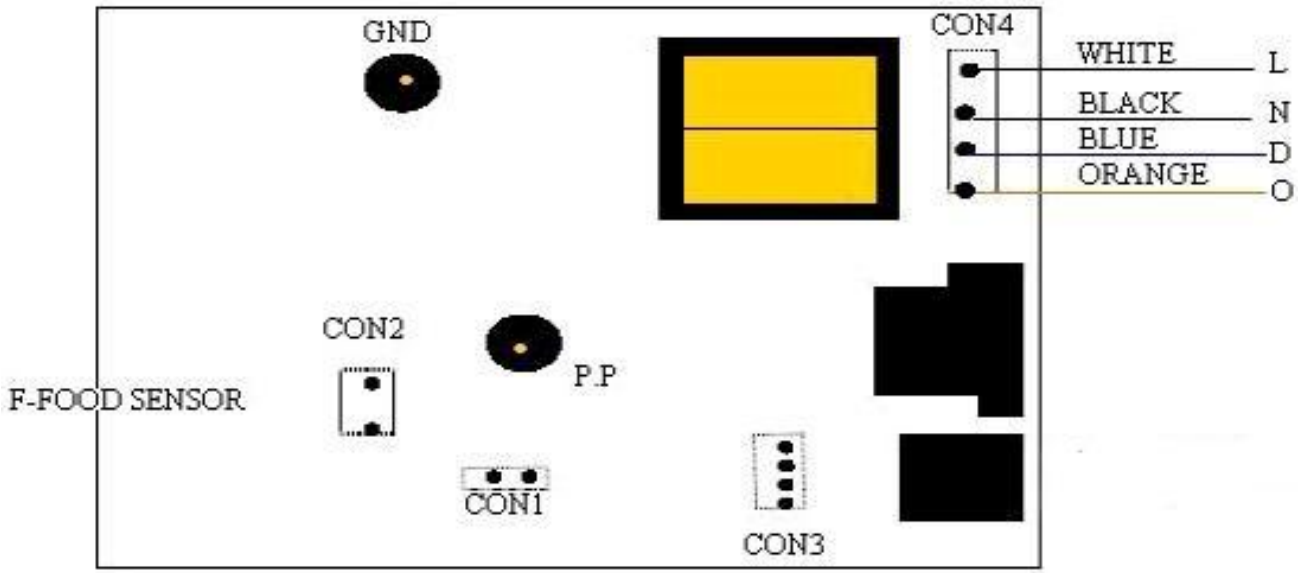
REGULATED VOLTAGE TEST OF THE BOARD

The tests described here must be carried out with the sensor located in the fresh food compartment and the potentiometer (temperature control) integrated to the board. In case any of these components is damaged, the whole assembly must be changed because each board is calibrated with these components.



ELECTRONIC CONTROL BOARD

DEFROST ELEMENT OPERATION



When applying voltage to the white and black cables the board is energized and 10 seconds later it sends a signal to the compressor to start working. You must now bridge test points GND and P.P., which will turn off the compressor. Three seconds later, a signal will be sent to the defrost element to start working and, at this moment, the white and blue cables must give a reading of 127 A.C.V.

NOTE: If the freezer sensor is connected and does not record the temperature, the board will not send the signal to the heater to initiate the defrost cycle.

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THERMISTOR TEST

Thermistors vary their resistance value according to the temperature they detect. For example, at room temperature they have low resistance. When the temperature decreases, the resistance value increases.

The following table shows the approximate readings based on a temperature scale. In fact, what is actually important about thermistors is that they must not show a reading of infinite value (open) or zero resistance (closed), and when they turn hot or cold their resistance value must vary.

Thermistors located in the freezer and in the fresh food compartment must have the same characteristics and values; the difference stems from the type of connector and the temperature they use to send a signal to the board.

TEMPERATURE	RESISTANCE	TEMPERATURE	RESISTANCE
40 °C (104°F)	3,000 Ω	5 °C (41°F)	10,700 Ω
35 °C (95°F)	3, 500 Ω	0 °C (32°F)	12,800 Ω
30 °C (86°F)	4,100 Ω	-5 °C (23°F)	16,000 Ω
25 °C (77°F)	5,000 Ω	-10 °C (14°F)	24,000 Ω
20 °C (68°F)	6,000 Ω	-15 °C (5°F)	34,000 Ω
15 °C (59°F)	7,800 Ω	-20 °C (-4°F)	45,000Ω
10 ° C (50°F)	9,300Ω		

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OPERATION

NOTE: THE VALUES BETWEEN EACH READING CAN VARY, BECAUSE THE THERMOMETER SENSES TEMPERATURE FASTER THAN THE THERMISTOR (SINCE THE THERMISTOR IS ENCAPSULATED). IF THE THERMISTOR IS KEPT AT A CONSTANT TEMPERATURE, THE RESISTANCE VALUE WILL BE HIGHER, BECAUSE BOTH THE THERMOMETER AND THE THERMISTOR TEMPERATURE WILL BE STABLE.

COMPRESSOR OPERATING CYCLE

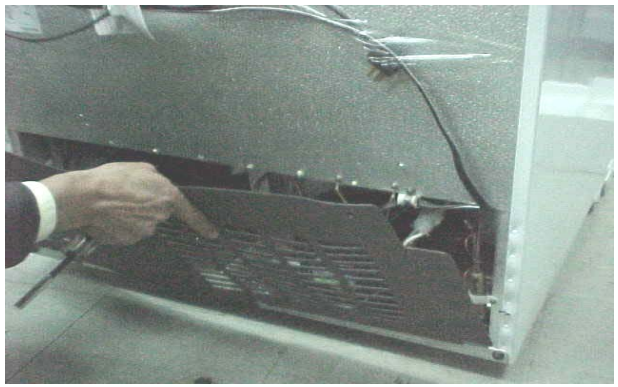
When the electronic board sends a signal to enable the operating cycle of the compressor, both the potentiometer and the temperature sensor start operating to precisely regulate compressor operation and keep food at the desired temperature. When the potentiometer's knob is turned, this indicates to the sensor the temperature range under which the fresh food compartment must be kept and, at the same time, the sensor, based on this range, sends a signal to indicate the compressor's periods of operation and idleness.

DEFROST CYCLE

When the refrigerator is connected for the first time or after a long period of not using it, the electronic board will send a signal to enable the defrost cycle after eight hours of accumulated compressor operating time, depending on the time the element is connected during the defrost cycle (20, 30, 40 minutes).

HOW TO REMOVE THE CONDENSOR FAN

1- REMOVE THE BACK PANEL



2- PLACE A PIECE OF WOOD UNDER THE REFRIGERATOR

3- REMOVE SCREWS ON EACH SIDE UNDER THE REFRIGERATOR

4- REMOVE TWO SCREWS AT THE BOTTOM BASE

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HOW TO REMOVE THE CONDENSOR FAN (cont.)

REMOVE THE GROUND SCREW

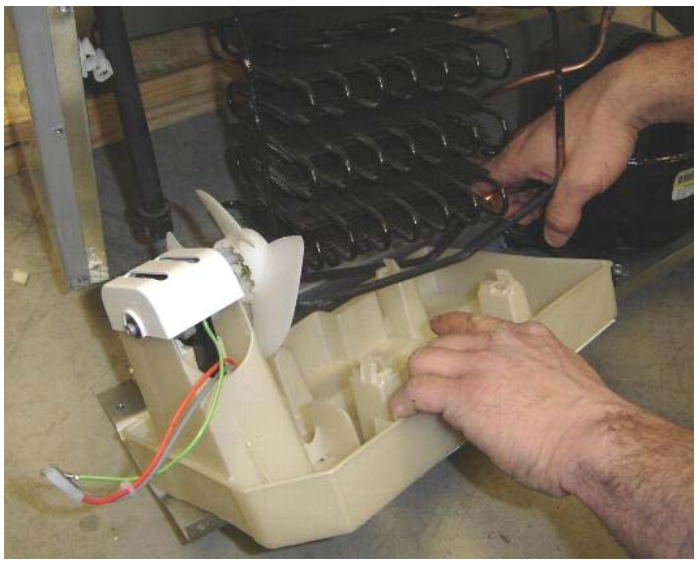
DISCONECT THE CONDENSOR FAN PLUG

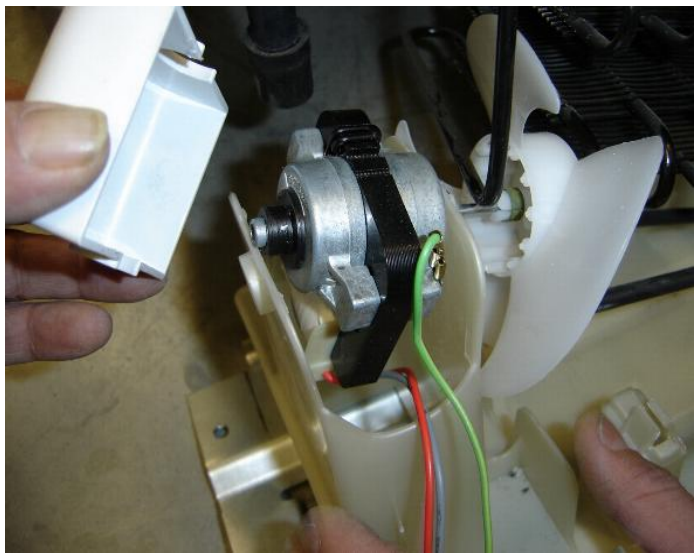
REMOVE THE CONDENSOR FROM THE PLASCTIC BASE

REMOVE THE PLASTIC BASE FROM THE METAL BASE SUPPORT

HOW TO REMOVE THE CONDENSOR FAN (cont.)

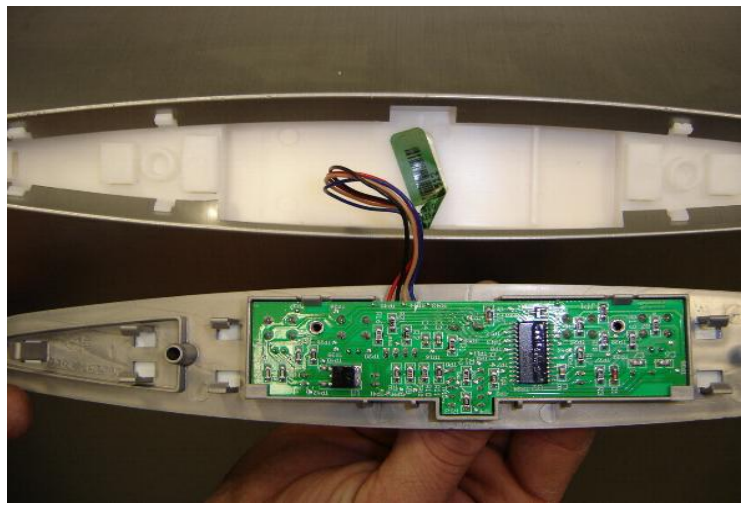
REMOVE THE PASTIC BASE INCLUDING THE FAN MOTOR





HOW TO REMOVE THE CONTROL IN THE DOOR

TO REMOVE THE CONTROL USE A PUTTY KNIFE,

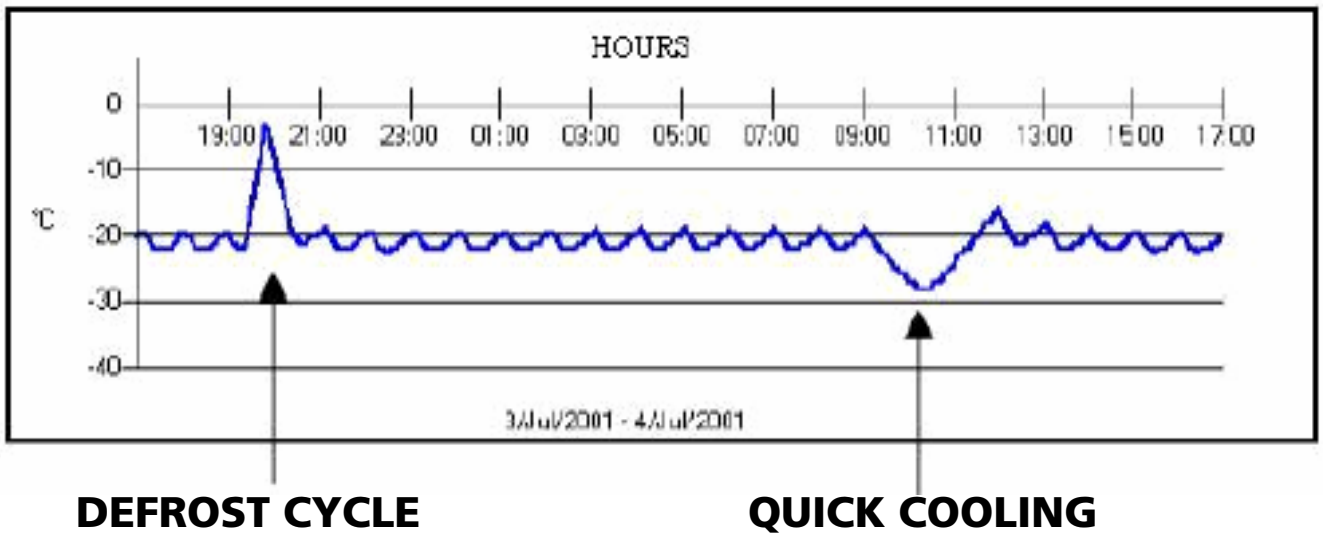


SPECIAL FEATURES

SUPER COOLING FEATURE (QUICK COOLING)

When this function is selected, the LED2 light turns on, which indicates that a signal is being sent to the board. When the shut-off temperature indicated by the thermistor and the potentiometer is reached, the board does not send the shut-off signal to the compressor, which continues operating non-stop for an hour. The LED light will turn off when the compressor stops operating. The following diagram shows the additional operating time and how the temperature decreases.

TEMPERATURE RECORD IN THE EVAPORATOR



SPECIAL FEATURES (cont.)

VACATION MODE FEATURE

When this function is selected, the LED1 light turns on, which indicates that a signal is being sent to the board. The defrost cycle will start according to the stored time in the board memory. The following defrost cycles will start after 48 hours of accumulated operating compressor time. This feature is cleared by the board's integrated photocell when the fresh food compartment door is opened.

OPERATION TEST

Select the Vacation Mode feature, which will turn on the LED1 light. Close the hole located in the upper front part of the air tower, on the fresh food compartment ceiling, to the right of the screw that holds the air tower. Wait a while and then open the hole again, which will turn off the LED1 light, indicating that the feature is not operating anymore.

When the electronic board sends the signal to activate the operating cycle of the compressor, the potentiometer and temperature sensor begin working to maintain food at the desired temperature. When the potentiometer knob is turned, it indicates to the sensor the temperature range within which the fresh food compartment is to be kept. Based on this range, the sensor then sends a signal to indicate the operation and rest periods of the compressor.

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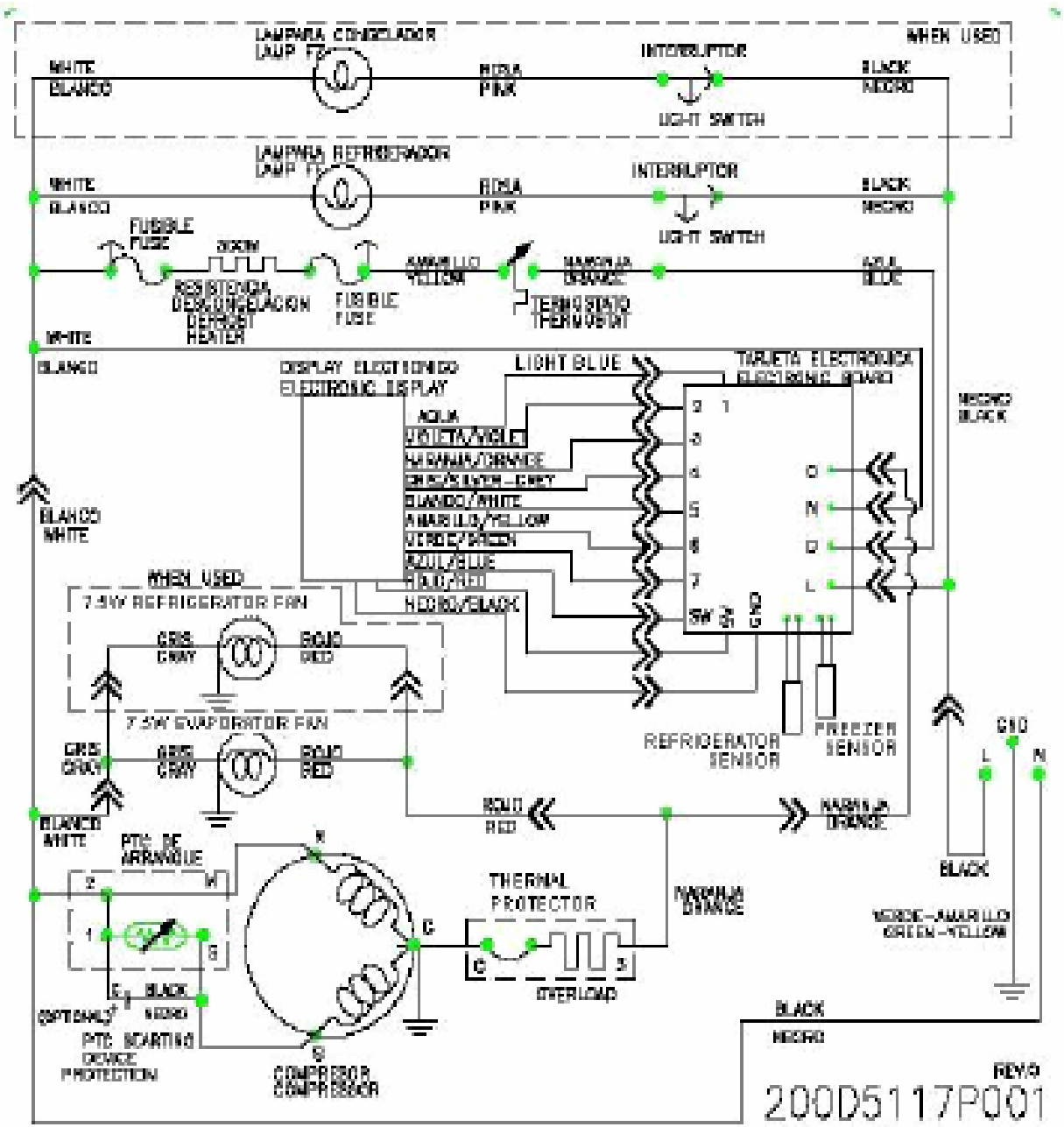
LAMPARA CONGELADOR
LAMP FZ
WHEN USED
WHITE
BLANCO
PINK
INTERRUPTOR
BLACK
NEGRO
LIGHT SWITCH
LAMPARA REFRIGERADOR
LAMP FR
INTERRUPTOR
FUSIBLE
FUSE
RESISTENCIA DESCONGELACION
DEFROST HEATER
AMARILLO
YELLOW
NARANJA
ORANGE
TERMOSTATO
THERMOSTAT
AZUL
BLUE
DISPLAY ELECTRONICO
ELECTRONIC DISPLAY
LIGHT BLUE
TARJETA ELECTRONICA
ELECTRONIC BOARD
AZUL/BLUE
NARANJA/ORANGE
BLANCO/WHITE
AMARILLO/YELLOW
VERDE/GREEN
ROJO/RED
NEGRO/BLACK
7.5W REFRIGERATOR FAN
GRIS
GRAY
ROJO
RED
7.5W EVAPORATOR FAN
REFRIGERATOR SENSOR
FREEZER SENSOR
PTC DE ARRANQUE
THERMAL PROTECTOR
OVERLOAD
PTC STARTING DEVICE PROTECTION
COMPRESOR
COMPRESSOR
REV.0
200D5117P001